Late autumn through late winter is often regarded as the “burn season” by many prescribed fire practitioners. Rightfully so. This is when warm season herbaceous vegetation is dormant and after abscission has dropped leaves from deciduous trees creating a fuel source under forest canopies. Herbaceous vegetation and leaves burn best when dormant and before rain, snow, or ice has caused lodging or packing of these fuels.

However, these fuels, especially herbaceous vegetation, will also burn during the growing season. Fire practitioners willing to burn during the growing season effectively extend their “burn season” to year-round. When asked the question “when is the best time of the year to burn?” John Weir at Oklahoma State University pauses briefly before answering “anytime between January 1 and December 31.” John also looked at weather conditions conducive for prescribed burning during the dormant and growing seasons in the southern Great Plains and found that there are many more days available for burning during the growing season. This is an extremely important consideration for landowners or managers wishing to accomplish several burns in one year.

Fuel type and load considerations are different for growing season burning. In the Cross Timbers ecoregion, there is usually good interspersion of herbaceous vegetation dominated sites and post oak-dominated woodlands. Dead standing herbaceous vegetation from the previous year’s growth is critical in carrying a growing season burn. With the exception of very dry conditions, woodland leaf litter in the Cross Timbers does not burn well during the growing season due to compaction and mineralization and overall less volume of leaves. In fact, Cross Timbers woodlands are often used as firebreaks for growing season burns. For these reasons, it is usually best to burn during the dormant season in sites where fuels are dominated by leaf litter.

Growing season burns, especially in September and October, are more effective at topkilling woody plants, greatly reducing woody plant density and encroachment into open areas over time. When ambient temperatures are high, lethal temperature for woody plants is quickly reached during growing season fires. Additionally, flame fronts generally move slower, increasing heat retention around woody plants.

Conducting growing season burns, in addition to dormant season burns, increases plant community heterogeneity and plant species diversity on...
In this study, authors demonstrate the impact of landscape-scale prescribed fire on a reintroduced species. They summarize findings of a 22-year project in which fire reestablished habitat for collared lizards (Crotaphytus collaris collaris) within glades and woodlands in the Ozark Highlands of southeast Missouri, USA. DNA was collected from nearly two thousand lizards to document the population’s dispersal, reproduction, and new glade colonization during three distinct land management periods: Phase 1 - fire suppression in woodlands that surround and connect fire-maintained glades; Phase 2 - initiation of prescribed fire in these woodlands and shortly thereafter; and Phase 3 - continuous, periodic woodland prescribed fire.

The study site was located on Stegall Mountain, within the 9300-hectare Peck Ranch Conservation Area, owned by the Missouri Department of Conservation (MDC). Here, collared lizards historically inhabited scattered igneous glades embedded within a fire-maintained woodland matrix. A top predator adapted to the open, dry, rocky glades in the Ozarks, collared lizards are considered a sensitive indicator of glade ecosystem function.

Effective fire suppression in the study area began in 1945, which led to the invasion of glades and surrounding woodlands by fire-sensitive eastern red cedar (Juniperus virginiana) and other shrub and tree species. Glade habitat was reduced, and a dense woody understory blocked collared lizards’ travel through the woodlands separating glades. About 75 percent of these populations had disappeared in the eastern Ozarks by the 1980s, including those on Stegall Mountain and surrounding areas. To improve habitat, MDC initiated prescribed burning in 1982 within glades, but not in the surrounding woodlands. See Templeton et al. 2011 for additional history about the study site and this long-term research project.

Starting in 1984, a total of 29 wild collared lizards from outside the area were released on three separate glades on Stegall Mountain over a five-year period. To ensure initial high levels of genetic diversity in the new populations, lizards were caught on four or five different source glades, and then uniformly mixed together on each of the three glades. Thus, starting conditions on the three reinhabited glades were similar; each glade was stocked with about the same number (9 or 10) of genetically diverse lizards. Throughout the study period, collared lizards were captured annually. They were marked with a toe-clip number and a blood sample or toe clipping was collected for genetic analysis, and then they were released. Commercial DNA technology was used to track gene flow and colonization throughout the three phases of land management.

Phase 1, from 1984-1989, began after the initial lizard releases. Although burning of the glades began in 1982, fire was suppressed in the surrounding woodland during this phase, and lizards did not move freely between glades. On the first glade, where 10 lizards were released in 1984, the population stabilized at 11 individuals after an early decline. In 1987, nine more were released on a second glade of similar habitat, about 50 meters from the first. This group dwindled to an estimated annual average of just 3.4 individuals. On a third glade, about 1700 meters distant from the first, lizards were not introduced until 1989, and its initial population of 10 grew to an annual average of 37 adults and yearlings by 1993.

RESEARCH HIGHLIGHT:
Genetic restoration in the eastern collared lizard under prescribed woodland burning

Jennifer L. Neuwald and Alan R. Templeton, Molecular Ecology, 2013, 3666-3679

Management Implications

- Landscape level restoration reversed declines in genetic diversity and population levels of collared lizards on Stegall Mountain in southeast Missouri, USA.
- Prescribed fire perpetuated vegetative conditions that promoted collared lizard dispersal and the colonization of new glades, resulting in a stable metapopulation.

Moving fire forward...
Research Highlight, continued:

During this first management phase, only two lizards were known to move between glades (none to new glades), indicating that each glade’s lizard population was effectively isolated. On all three glades, expected signs of population fragmentation developed, particularly on the sparsely-populated second glade, where genetic diversity dropped dramatically. The other two glades’ populations also became less diverse, with decreases in the number of genetic markers. Genetic differentiation between the three groups increased significantly.

Phase 2, from 1994 to 1999, immediately followed the initiation of prescribed fire within the woodland matrix. In 1994 about half the mountain was burned, and the fires were later expanded to the entire mountain. Fire reduced the understory vegetation in the woodlands, facilitating collared lizard movement between glades. This stimulated a colonization phase during which all ages and genders, but particularly hatchlings and yearlings, moved between glades, including into ‘new’ glades, where no lizards had been released. Newly colonized glades were generally founded by just a few lizards and dispersal was generally limited to glades in close proximity to the original glades.

Overall, population grew during this period. Lizard population on the first glade grew modestly, from 11 to an annual average of 17.6 individuals. The population on the second glade rebounded from an average of 3.4 to 19.8 lizards. Although the area around the third glade was not burned until later, its population grew from an average of 21.4 to 47.8 individuals. By 1999, the collared lizard population on the mountain had grown from 29 to 143.

Colonization increased genetic mixing, halting the loss of genetic diversity that dominated the first phase. On 22 glades colonized between 1994 and 2000, colonists came from at least two source glades. On many glades, every newcomer originated from a different source glade. Even on the three original glades, incoming lizards stabilized genetic diversity.

During Phase 3, from 2000 to the study’s end in 2006, all the woodlands surrounding and connecting glades were burned periodically. The year 2000 marked the beginning of a demographically stable collared lizard metapopulation that has continued beyond the end of the study period, with a mountain-wide population in equilibrium averaging 372 annually. Between 44 and 55 glades were occupied at any given time, with a balance between glade extinctions and recolonizations. Hatchling dispersal increased significantly, and travel distances increased. However, despite evidence of a few movements over long distances and even to new mountains in an expanded burn area, the lizards typically dispersed to adjacent glades. During this period, genetic mixing became so widespread that researchers were not always able to use DNA markers to identify a colonist’s source glade.

Authors concluded that managing small patches of suitable habitat (i.e., individual glades) did not create adequate conditions for collared lizards to repopulate Stegall Mountain and was not sufficient to protect this vulnerable species from genetic degradation. Managing woodland habitats with prescribed fire at the landscape level facilitated collared lizard population dispersal and recolonization, thus reversing genetic degradation and leading to a stable metapopulation.
GROWING SEASON FIRE, cont. from pg1:

a property. Varying vegetative structure across a property benefits a greater number of wildlife species than if only one vegetative structure is present. Additionally, growing season burning creates a greater diversity of forbs that are invaluable to many species of wildlife such as northern bobwhite and pollinators such as Monarch butterflies and bees. It is often easier to create patchy burns during the growing season, further increasing heterogeneity and plant diversity. This is easily accomplished when a property is divided into several burn units and burned at different times of the year, and during different years. This is more difficult to plan but has huge advantages over dormant season burning only.

Burning native herbaceous plant communities during the growing season can extend forage quality for cattle. Rather than relying on typical high quality forage only during the spring, burning in early summer and again (different pastures) during late summer will provide high quality forage longer into the year. Cattle stocking rate is the key to having available fuel to burn. The size of the burn units are variable depending on goals and objectives for the property or pasture, stocking rate, and the number of pastures. A lot of research and work has been conducted on patch burn grazing where pastures are not divided and cattle or bison have free access to freshly burned units during all seasons of the year. With proper stocking rates, this can be a very successful way to manage for cattle production while simultaneously improving and providing habitat for wildlife.

“Prescribed Burning: Spotfires and Escapes,” a new fact sheet from Oklahoma Cooperative Extension Office

Suppressing a Spotfire and Escaped Fire ● Reducing Spotfire Risk ● Fuel Reduction Close to the Firebreak

Spotfires are ignitions outside a prescribed burn area, typically caused by windborne embers, which are extinguished by people and equipment on site. An escaped fire begins as a spotfire, but becomes too large for on-site resources to control, and outside assistance is required to suppress the fire.

To view fact sheet, CLICK HERE
2017 Fall Fire Science Webinar Series

Dr. Heather Alexander, Mississippi State University
Mesophication of Eastern Oak Forests: Vulnerability and Resilience with the Loss of Fire Disturbances

October 10, 2017 — CLICK HERE to watch recording

Dr. Matthew Dickinson, USDA Forest Service, Northern Research Station
How trees are injured in fires – new approaches and applications

October 24, 2017 — CLICK HERE to watch recording

Dr. Callie Jo Schweitzer, USDA Forest Service, Southern Research Station
Stand Dynamics during Transition from Pine Plantations to Mixedwoods using Thinning and Prescribed Burning Prescriptions

November 14, 2017, 1 p.m. CST

Dr. Dwayne Elmore – Oklahoma State University
Management of Oak Forests for Northern Bobwhite

December 12, 2017, 1 p.m. CST

Landowner Fire Ecology Workshop Series

The Oak Woodlands and Forests Fire Consortium and partners will be hosting three fire ecology workshops for interested landowners and the public, featuring in-the-field discussions plus indoor presentations.

DATES AND LOCATIONS

• Winona, MO
  May 12, 2018

• Farmington, MO
  June 2, 2018

• Cassville, MO
  Date to be announced

More information coming soon HERE
Bridgestone/Firestone Prescribed Fire Demonstration Area

Located on the Cumberland Plateau in White County, Tennessee, this fire science demonstration site comprises 156 acres of the Bridgestone/Firestone Wildlife Management Area, which is owned and managed by the Tennessee Wildlife Resources Agency (TWRA). Recognizing the regional need, TWRA and University of Tennessee Extension established the site in 2011 to display the effects of fire frequency and season of burning (timing) on the plant community, and how fire might be used when managing for a particular ecosystem, such as an oak/pine savanna, or particular wildlife communities. This information helps biologists and land managers make better informed decisions related to fire prescriptions in this region. Special focus has been placed on research and public outreach, including tours for professionals and the general public (bottom-right photo) and fire science research projects. Prior to establishment, most of the demonstration area was a loblolly pine plantation (top-left), with little herbaceous / forb growth in the heavily-shaded understory. To date, since prescribed burning began, more than 200 plant species have been identified with no non-native species occurring within the area (bottom-left). Though no seeding or planting has occurred, many plant species valuable to native pollinators, such as wavy-leaf milkweed (Asclepias amplexicaulis, inset bottom-left), sundrops (Oenothera fruticosa, inset top-right), yellow-fringed orchid (Platanthera ciliaris, inset top-left), and other rare and important plants are now found here.

The demonstration area is divided into 7 management units (15-34 acres), each with a different fire frequency and burn season. Most (6 of 7) are burned on 1, 2, or 3-year fire return intervals, with each frequency including one unit burned in the spring (April) and one in the late summer/early fall (August–October). One of the seven units is burned at a randomly determined frequency (1-7 years) and season, and contains a mature hardwood overstory. Pictured top-right, is the October 2011 fire in the 3-year fire interval unit; bottom-left shows results from spring burning every 2 years. Under the direction of Dr. Craig Harper (University of Tennessee), response of the plant community has been recorded each year by graduate students and technicians, then related to habitat requirements of various wildlife species. A self-guided interpretive trail (inset, bottom-right; click HERE) traverses the different prescribed fire units showing fire effects on the plant community, offering land managers insights on how to best manage for particular ecosystems and certain wildlife communities. Click on each photo for full-size and downloadable images. Photo credits: bottom-right and milkweed: Dan Dey; all others: Craig Harper.
SPOTLIGHT

In an effort to introduce you to new people and information from the region, we interview fire practitioners and researchers about timely topics. In this issue, we asked these questions of Heidi Bailey, Texas Parks and Wildlife Department.

What are some of the greatest fire research needs for Texas?

HB: There have been great strides in fire research over the years, and I believe we already understand a good deal about disturbance, fire effects, and fire ecology. One area where I think additional research would be useful, especially in Texas where the land is over 96% privately owned, is the “Sociology of Fire.” What (if anything) does the public think about prescribed fire? How big of an effect does fragmentation and absentee landownership have on getting fire on the ground? Many landowners profess that they are in favor of prescribed fire and would like to do it on their land, but how much actually gets burned? What are the biggest barriers to prescribed fire and how can we overcome them? How do we get landowners “over the hump” from just liking the idea or being interested to actually implementing a burn? We can do our best to manage every acre of public land with fire, but if landowners don’t get on board, we haven’t accomplished large scale habitat management and restoration across the landscape.

What is your biggest concern when deciding to use fire to manage oak woodlands and forests?

HB: I look at every prescribed burn as a “sales pitch.” Every burn, implemented safely and with good fire effects, can help “sell” fire as a management tool and opens up the door for us to talk to the public about the history and benefits of fire. Conversely, a fire that escapes, has major smoke issues, or is otherwise unsafe can often guarantee that a formerly interested landowner will never buy into conducting prescribed burns and may even become actively anti-fire. The difficulty often lies with the public perception. Sometimes a hot, “scary” fire is exactly what is called for to accomplish the burn objectives, and as prescribed fire practitioners it is up to us to manage any negative perceptions of fire by 1) doing the job safely and professionally, and then 2) educating the public at every opportunity.

In your opinion what is the greatest advantage to using prescribed fire when managing oak woodlands and forests?

HB: I believe that prescribed burning delivers the absolute best bang for the buck. No other woodland management practice can reduce fuel loads, encourage nutrient cycling, manage understory vegetation, improve wildlife forage palatability and quality, increase diversity, and help restore native vegetative communities—all for the price of a burn. Mechanical or chemical treatments can accomplish some of these results, but rarely all at the same time, and never as cost-effectively or time-effectively as a burn. When we show landowners the results of strategic fire applied over time, and then tell them how much it costs, prescribed burning becomes a viable and desirable management option for them.

Heidi Bailey is a regulatory wildlife biologist for the Texas Parks and Wildlife Department (TPWD) in the Post Oak Savannah ecoregion of Texas. She started in fire 18 years ago dragging a drip torch on TPWD lands as a wildlife technician, and now assists with prescribed burns on federal, state, and private lands across Texas. As a TPWD biologist, one of Heidi’s main duties is to work with private landowners to help them manage, enhance, and restore their wildlife habitat, and she figures one of the most effective ways to do that is to be a “fire evangelist.”

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2018 Illinois Prescribed Fire Council Symposium
February 6 & 7, 2018
Giant City Lodge, Makanda, Illinois
Theme: Prescribed Burning across Southern Illinois Landscapes
For more information, CLICK HERE

Moving fire forward...
UPCOMING EVENTS

FireVision 20/20: A 20 Year Reflection and Look into the Future:
7th International Fire Ecology & Management Congress
November 28–December 2, 2017, Orlando, Florida

Topics include: Fire Ecology & Effects; Fire Management and Use;
Fire Modeling; Climate Change & Fire History; GIS and Remote
Sensing; Smoke Management & Modeling
Also featuring more than a half-dozen field trips

CLICK HERE for more information

See our Upcoming Events at oakfirescience.com for a full event schedule

November 7, 2017: Using Avenza Maps on the Fireline
Harrisonburg, VA, for more information, CLICK HERE

November 8-9, 2017: Central Appalachians FLN Annual Workshop
Harrisonburg, VA, For more information, email Laurel Schablein

November 10-12, 2017: Texas Society for Ecological Restoration Annual Conference
Denton, TX, for more information, CLICK HERE

November 14, 2017: Webinar—Stand Dynamics during Transition from Pine Plantations to
Mixedwoods using Thinning and Prescribed Burning Prescriptions
Dr. Callie Jo Schweitzer, for more information, CLICK HERE

Albuquerque, NM, for more information, CLICK HERE

(AFE) 7th International Fire Congress
Orlando, FL, for more information, CLICK HERE

December 12, 2017: Webinar—Management of Oak Forests for Northern Bobwhite
Dr. Dwayne Elmore, for more information, CLICK HERE

February 6-7, 2018: 2018 Illinois Prescribed Fire Council Symposium
Makanda, IL, for more information, CLICK HERE

February 27 — March 1, 2018: Wildland Urban Interface 2018
Reno, NV, for more information, CLICK HERE

March 26-29, 2018: National Cohesive Wildland Fire Management Strategy Workshop
Reno, NV, for more information, CLICK HERE

Missoula, MT, for more information, CLICK HERE

October 1-3, 2018: Great Plains Prescribed Fire Summit
Ardmore, OK, for more information, CLICK HERE

Please contribute your event announcements. Send information to oakfirescience@gmail.com

Moving fire forward...